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### A guide to common visual terms

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## A guide to common visual terms

### Abstract

The need for a glossary of common visual terms was felt to exist. Input from practicing doctors, educators, and students was combined with personal ideas to arrive at the words to be defined. After several reviews of the definitions the glossary was completed. The test of its validity included a pretest and post-test. A questionnaire was also included after the testing. A t-test showed significant improvement between pre and post-tests. The results of the questionnaire revealed a favorable opinion of the glossary's style and content.

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Robert L. Yolton

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THESES  
OPT.  
NYWALL S

A GUIDE TO COMMON VISUAL TERMS

In partial fulfillment of the  
requirements for the degree of  
Doctor of Optometry

Submitted by  
Soren Nywall  
Robert Rehm  
Terrence Tancabel  
Kenneth Thue  
November 1978

*Volton A*

Advisor  
Dr. Robert L. Yolton

## Abstract

The need for a glossary of common visual terms was felt to exist. Input from practicing doctors, educators, and students was combined with personal ideas to arrive at the words to be defined. After several reviews of the definitions the glossary was completed. The test of its validity included a pretest and post-test. A questionnaire was also included after the testing. A t-test showed significant improvement between pre and post-tests. The results of the questionnaire revealed a favorable opinion of the glossary's style and content.

The thrust of this research project is to attempt to provide a vehicle whereby the general public and special service organizations such as the Lions clubs would become more knowledgeable in the field of vision care and be better able to understand the conditions or situations that pertain to their own vision.

The questions arose as to what type of vehicle should be provided to fulfill the criterion of making the public better informed concerning vision care and terminology. It was decided that whatever method was incorporated, it should fulfill five basic criterion to be effective. In order to provide insight and education, it should: 1) be interesting to the reader to the extent that he will not look at the learning situation as a chore, but rather as an enlightening experience; 2) the material presented should be readily understood and written in such a way that the non-scientific reader could receive maximum information with a minimum of scientific jargon; 3) be concise and to the point, so that the reader is able to learn as much as possible about vision in as little time as possible; 4) provide a ready reference source for questions which may arise from a visit to an eye doctor or an article in a newspaper or magazine concerning vision; and 5) be inexpensive enough so the information can be distributed without excessive cost to any organization or individual.

The various options considered varied from a self-instructional program, to a mini-textbook covering ocular anatomy, physiological optics, and pathology. It was thought that programmed instruction would provide a very good method of getting the essential subject material across to the readers, but that it would not provide an easily used reference to terminology and concepts. The idea of writing an abbreviated textbook of visual science was discarded.

as being too unwieldy, and again, as not providing an easy, quick access to visual information.

The idea of creating a glossary of terms commonly used in the ophthalmic field was presented. This would be short enough so not to overwhelm the reader, yet complete enough to provide basic information about vision and maintain interest. This format would provide a quick reference and it would be abbreviated in that it would not be bogged down with information uninteresting to the nonprofessional. It would also be relatively inexpensive to have mass produced. The only drawback to the glossary was the fact that a glossary does not provide a continuous flow, but rather discrete packets of information. It was felt that this would not be a major obstacle since about one hundred terms were to be included and only one hour's reading would be necessary to pursue all the information provided.

A search of the current literature revealed that a glossary had been created a few years earlier.<sup>1</sup> This glossary was felt to be inadequate for several reasons. First, the glossary was 93 pages long. It's format was one definition per page. This resulted in an unwieldy document which would be expensive to duplicate in its exact form. Second, it had no phonetics. We believe the correct pronunciation of a strange word is very important to the understanding of that word. Third, in the opinion of this group, some of the definitions were too technical and could be simplified with easier words. Fourth and most importantly, only two people were queried on each definition as to their ability to discern what had been written. After these queries, the length of the definitions were reduced to 50 to 75 words. As a result, the final form of the definitions was not tested. A more useful glossary for laymen such as the one we envisaged was not in existence at this time nor being contemplated. There are many pamphlets and brochures published by

various organizations including the American Optometric Association<sup>2,3</sup> that provide some excellent insights concerning specific vision problems. However, they address themselves to usually no more than five to ten terms or visual conditions, and thus to provide even the rudiments of completeness, a large number of these pamphlets would be necessary. The idea of compiling all these materials and distributing them to the public was rejected because it was felt that they could easily become lost and certainly would be difficult to search through for specific information. Since no other options presented themselves, it was decided to create a glossary which would fulfill the previously mentioned criteria.

The first questions which arose concerned what terms to include in the glossary. Questionnaires were sent out to several practicing optometrists requesting their input as to what a well-informed person should know. Queries were made of optometry educators and optometry students in this same regard. Words were solicited on the basis of their falling into one of these categories: general misunderstanding or misconception of a word; a common visual condition or condition with visual side effects; a need to expand current common knowledge in a particular area; words used to describe or classify a condition; a brief description of procedures and equipment used in an eye examination. Any areas not covered were left to the individual's discretion as a "catch all" category. What emerged from all this was a fairly consistent consensus on those visual terms which were deemed appropriate for the informed layman to be familiar with.

A schematic diagram of the human eye would be provided in the glossary which labeled various structures alluded to in the body of the material. A cross reference list was also included as it was deemed desirable to direct the user to other related words and to restate some commonly used layman's



terms with more appropriate terminology.

One hundred and five terms, obtained from the questionnaires and group discussions among the research project members, were defined in the glossary. The terms were defined and presented in such a manner that essential information was provided, but in no way was this information meant to be the "last word" in a diagnosis nor was it directed towards eye doctors. Definitions were written to be as clear, concise, and as accurate as possible without too much professional terminology. Initially, the definitions were derived from various reference sources listed in the bibliography in addition to those received from the questionnaires. These definitions were usually too lengthy and contained too much professional terminology to be included in a glossary such as this. Therefore, group discussions were used to make the definitions more concise and written in simpler or laymen's terms. Four revisions were needed to finalize the terms and their definitions in the glossary.

Various methods were proposed to evaluate the glossary to ascertain if it fulfilled the requirements of being an educational tool. Some of the methods considered were: personal interviews with individuals before and after using the glossary; soliciting evaluations from the users after reading the material; merely checking to see if the glossaries were being used at all; and the administration of a written evaluation in the form of a test. What was finally decided upon was an evaluation consisting of two parts: 1) pretest vs. post-test results and, 2) a questionnaire given to each person after they had used the glossary.

A sample consisting of ten third-year optometry student's spouses and 20 patients of the Optometric Clinic at Pacific University were used as subjects

in the evaluation of the effectiveness of the glossary.

The spouses were used as one group who possessed what was considered more than a normal background in the field of vision. They would most closely approximate optometric assistants. The 20 patients were tested after they had received their visual examinations. These people represented the general lay population.

The evaluation consisted of giving the subject a pretest, then after a period of study of the glossary, a second (post) test was given and the results compared to the first.

The tests consisted of 25 multiple choice questions including some of the more common visual terms and some terms that a person may be confronted with in an eye doctor's office.

The following instructions were given to all 30 subjects. "Read and answer the following questions to the best of your ability. Afterwards you will be given a manual to study for 15 minutes and a test covering the same material will be given again." In actuality, the exact test was given the subjects after their period of study.

The questionnaires that were administered investigated these general areas:

- a) Did the glossary include the term(s) you were looking for?
- b) Did it answer your questions concerning the term or condition you were investigating?
- c) Was it thorough enough or did you feel that you needed more information?
- d) What type of additional information do you think would have been helpful for your understanding of the term or condition you were investigating?

The results of the test are as follows:

THIRD YEAR OPTOMETRY SPOUSES

Number Correct

<u>Subjects</u>	<u>Pretest</u>	<u>Post-Test</u>
1	24	25
2	19	21
3	22	23
4	17	21
5	15	18
6	20	23
7	21	22
8	18	21
9	19	22
10	18	20

GENERAL CLINIC PATIENTS

Number Correct

<u>Subjects</u>	<u>Pretest</u>	<u>Post-Test</u>
1	7	12
2	2	1
3	10	15
4	11	17
5	16	20
6	7	9
7	4	8
8	11	16
9	15	19
10	9	8
11	1	5
12	7	12
13	2	6
14	6	7
15	8	14
16	17	21
17	11	15
18	10	11
19	7	16
20	5	10

A t-test analysis for correlated samples was done on the spouse's data as well as the data from the general clinic patients. In both groups the analysis

showed statistical significance beyond the .001 level.

Upon completion of the post-test, the questionnaire was given to each participant.

The questions and their results are as follows:

1. How many of the terms contained in the glossary were you unfamiliar with?

	<u>Clinic Patients</u>	<u>Spouses</u>
a. less than 25%	1	2
b. about 25%	4	7
c. about 50%	6	1
d. about 75%	6	0
e. more than 75%	3	0

2. Did the glossary contain the terms you were searching for?

	<u>Clinic Patients</u>	<u>Spouses</u>
a. about all of them	6	10
b. 75% of them	10	0
c. 50% of them	2	0
d. 25% of them	1	0
e. less than 25% of them	1	0

3. Do you feel this glossary is of use to you in better understanding your visual system?

	<u>Clinic Patients</u>	<u>Spouses</u>
a. yes	17	10
b. no	3	0

4. Do you feel the glossary's definitions were:

	<u>Clinic Patients</u>	<u>Spouses</u>
a. much too complicated	7	3
b. about right	13	7
c. too easy	0	0

5. What additional material would you like to see included in this type of glossary?

Only 13 clinic patients made comments on question number five. One person expressed a desire to see more diseases listed. Two people thought more drawings or visual aids were needed. Three people thought many words were too technical. One person felt the glossary was too long. The other six people thought the glossary was complete as is and considered it an excellent guide for patients.

Of the optometry spouses, two of them thought some of the terms were much too technical. The other eight all thought the manual was good enough in it's present state.

A study of the results of the pre- and post-quizzes and the responses to the questions are very encouraging. They show a definite improvement in both population samples between the time of the pretest and the post-test. Not until after the post-test was completed were any of the subjects told what a term did or did not mean. Therefore, much of the improvement in scores between the pre-test and post-test can be attributed to the glossary.

Further evidence of the glossary's usefulness can be seen in the questionnaire administered after completion of the post-test. Sixteen out of twenty of the general clinic population surveyed said the manual contained 75 percent or more of the terms they were searching for. Seventeen of twenty stated they felt the manual helped them to better understand their visual health. In the Optometry student's spouse population, ten out of ten said the manual contained about all the terms they were searching for. All ten also felt it was of use to them in terms of understanding visual health.

In our design to determine and evaluate the effectiveness of the vehicle of communication, we had established five basic criterion. The first was to make the vehicle interesting and enlightening. We believe this was fulfilled as is shown by twenty-seven of thirty subjects stating they thought it gave them a better understanding of their own visual system.

The second criteria was to make the material easy to understand with a minimum of scientific jargon. In this respect, we tried to make the terms and definitions as simple as possible. Unfortunately, we still had five of thirty subjects state they felt the words and/or terms were too difficult. For this reason a cross reference guide was created and attached to the end of the glossary. This cross reference guide was not tested, but it is the belief of the authors that it should help further explain some of the more technical words through the use of layman's terms.

The third criteria established was to make the final product concise and to the point. In the survey, only one out of twenty-three responses stated the glossary was too long while fourteen of twenty-three thought it was complete as is.

The fourth criteria was to create a ready reference source. The survey results show twenty-six of thirty subjects thought the glossary had at least 75 percent of the terms they were searching for.

The fifth criteria was to create a vehicle inexpensive enough to distribute without excessive cost. The total length of the glossary, including title page and cross reference, is only thirteen pages. Therefore, the glossary should be reproduceable for only pennies per copy.

We believe that all the criterion stated originally have been fulfilled. The results of the pre- and post-tests, along with the questionnaire, appear to support this belief. We further believe we have created a vehicle which does increase the knowledge of vision in general and of vision care specifically. The creation of this guide to common visual terms satisfies the need and fulfills the goal which the entire project originally sought to do.

A Guide to Common Visual Terms has received promising acceptance from its inception. About one thousand copies have been distributed to Lions Club members in Southern Oregon. It has also gone to the faculty of the Washington State School for the Blind in Vancouver, Washington. It will soon be distributed to several hundred special education teachers and other educators in the area of learning disabilities within the state of Washington.

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## Sample Test

1. A visual condition in which you can see things far away more clearly than things that are up close is called:
  - a. presbyopia
  - b. myopia
  - c. hyperopia
  - d. retinoscopy
2. The process whereby the pupil of the eye becomes larger is called:
  - a. ptosis
  - b. miosis
  - c. mydriasis
  - d. phorias
3. A chronic relatively painless inflammation of an oil gland on the eyelid:
  - a. is called a chalazion
  - b. usually interferes with vision
  - c. often leads to night blindness
  - d. may be the first sign of cataracts
4. The area of maximum visual acuity on the retina is the:
  - a. fundus
  - b. fovea
  - c. optic nerve
  - d. iris
5. A procedure which measures electrical signals from the portion of the brain associated with vision is called:
  - a. retinoscopy
  - b. VER
  - c. biomicroscopy
  - d. electrographics
6. The mucous membrane that lines the inner portion of the eyelid and the outer portion of the eyeball is the:
  - a. retina
  - b. scotoma
  - c. conjunctiva
  - d. none of the above
7. A drooping of the upper eyelid, either congenital or acquired, is called:
  - a. miosis
  - b. mydriasis
  - c. cataract
  - d. ptosis

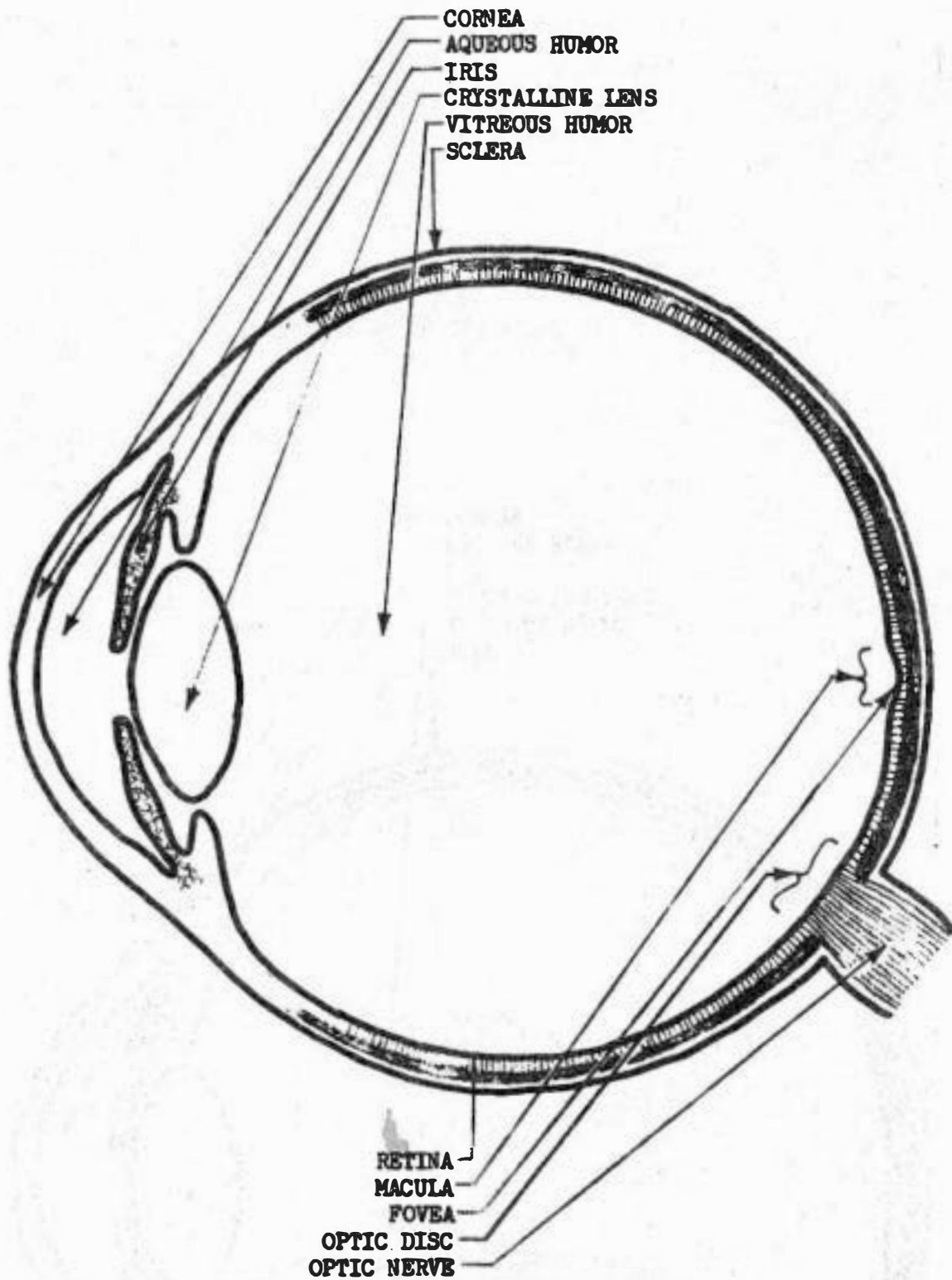


8. Tonometry is:
- a. a procedure used to check pressure within the eye
  - b. a procedure used to measure IOP
  - c. a test to detect glaucoma
  - d. all of the above
9. The examination of the structures and general state of health inside the eye is termed:
- a. ophthalmoscopy
  - b. refraction
  - c. stereoscopy
  - d. retinoscopy
10. The term used to describe the visual condition where both eyes do not point in the same direction at the same time:
- a. nyctalopia
  - b. refractive error
  - c. strabismus
  - d. ptosis
11. An uncontrollable rapid oscillation of the eyeball is known as:
- a. mydriasis
  - b. nystagmus
  - c. chalazion
  - d. exophthalmus
12. A visual condition in which a person can see better at near than at a distance is:
- a. hyperopia
  - b. myopia
  - c. presbyopia
  - d. aphakia
13. The fluid pressure of the eye is referred to as:
- a. extraocular pressure
  - b. vitreous pressure
  - c. intraocular pressure
  - d. barometric pressure
14. The amount of nearsightedness, farsightedness, or astigmatism an individual has is their:
- a. refraction
  - b. refractive error
  - c. emmetropia
  - d. accommodation

15. A cloudiness or opacity in the crystalline lens which affects many older people is a(n):
- a. cataract
  - b. edema
  - c. phoria
  - d. macula
16. A condition where light rays from a distant object come to a perfect focus on the retina with no accommodative effort is called:
- a. hyperopia
  - b. myopia
  - c. emmetropia
  - d. astigmatism
17. A common condition in which the non-spherical shape of the cornea prevents light rays from being focused to a clear image on the retina is called:
- a. Bell's palsy
  - b. astigmatism
  - c. myasthenia gravis
  - d. amblyopia
18. The term used to describe an eye that has had its lens removed by surgery or in which the lens has been absent since birth:
- a. myopia
  - b. aphakia
  - c. astigmatism
  - d. glaucoma
19. An unexplained decrease in clarity of vision which is not caused by disease and is not corrected by lenses is called:
- a. aphakia
  - b. presbyopia
  - c. amblyopia
  - d. hyperopia
20. The process of changing the shape of the lens to maintain clear vision at different distances is called:
- a. nystagmus
  - b. accommodation
  - c. convergence
  - d. astigmatism
21. The cornea:
- a. is the clear front portion of the eye
  - b. is the membrane that lines the inner portion of the eyelid
  - c. contains photoreceptors that send visual information to the brain
  - d. none of the above

22. The name for the loss of accommodative power which makes a person feel as if "his arms are too short." This usually begins to occur at about age 40. Bifocals are usually prescribed to remedy this.
- a. nyctalopia
  - b. mydriasis
  - c. glaucoma
  - d. presbyopia
23. An instrument which contains many lenses and is used by the eye doctor to perform many tests is the:
- a. tonometer
  - b. keratometer
  - c. retinoscope
  - d. phoropter
24. A class of drugs used to inhibit accommodation and to dilate the pupil is called:
- a. cycloplegics
  - b. miotics
  - c. hyperoptics
  - d. none of the above
25. The condition in which there is an increase in pressure inside of the eye is:
- a. glaucoma
  - b. Bell's palsy
  - c. myasthenia gravis
  - d. presbyopia

# SCHEMATIC VIEW OF THE HUMAN EYE



**ACCOMMODATION** (a-kom''-ō-dā'-shun) The process of changing the shape of the lens of the eye to maintain clear vision at various distances.

**ACCOMMODATIVE SPASM** (ah-kom''-ō-dā'-tiv) A condition in which there is too much accommodation in effect, i.e. the accommodative system of the eye is cramped so that one can see clearly at a given distance but cannot relax accommodation to see things far away.

**AMBLYOPIA** (am''-blē-ō'-pē-ah) An unexplained decrease in the clarity of vision with no detectable eye disease. Even with proper corrective lenses the vision of the eye is still below normal. Sometimes amblyopia can be improved with a visual training program.

**APHAKIA** (ā-fā'-kē-ah) The condition in which an eye does not have a crystalline lens. This is usually a result of surgical removal of the lens due to cataracts, but could also be an absence of the lens since birth.

**AQUEOUS HUMOR** (ā'-kwē-us hū'-mor) A watery substance secreted into the eye which carries oxygen and essential metabolites. As new aqueous is secreted, the old is absorbed back into the body. If the absorption is blocked for one reason or another, high intraocular pressure may result. (See diagram of the Eye.)

**ASTIGMATISM** (ah-stig'mah-tism) A common condition in which the non-spherical shape of the cornea prevents light rays from being focused to a clear image on the retina. This results in objects appearing blurry and can be corrected using cylinder lenses.

**BELL'S PALSY** A paralysis of the facial nerves usually associated with only one side of the face. A person with Bell's Palsy cannot completely close his eyelid on the affected side.

**BIFOCAL** A spectacle lens that has two parts, one for seeing objects far away and one for seeing objects up close. This lens allows a person to see clearly at near and at far with a single pair of glasses. This type of lens is necessary when accommodation is no longer making its automatic adjustment to changes in viewing distances.

**BINOCULAR VISION** The ability to use the two eyes to look at the same object at the same time. The image from each eye is "combined" in the brain to form a single visual perception.

**BIOMICROSCOPY** (bī''-ō-mī-kros'-kō-pē) The examination of the internal and external structures of the eye using a narrow beam of light and a microscope. This procedure is used to check the eye's lens and cornea, to detect any unusual material in the aqueous, and to evaluate the fit of contact lenses.

**BLEPHARITIS** (blef''-ah-rī'-tis) An inflammation of the eyelids. The lid margins have a red, irritated appearance with scales clinging to the lashes. The inflammation may start in the lids or spread there from other areas. Conjunctivitis and keratitis may be associated with blepharitis. A loss of lashes in patches may occur in severe cases.

**BLIND SPOT** The area at the back of the eye where the optic nerve exits from the eye. This area is not sensitive to light and no vision takes place here. The blind spot is normally not noticed.

**CATARACT** (kat'-ah-rakt) Any opacity or cloudiness in the crystalline lens of the eye which may cause reduction in vision. Minor opacities occur in as many as 95% of patients over the age of 65. Cataracts may become more dense with increasing age and in some people the cataracts must be removed to restore clear vision.

**CHALAZION** (sha-lā'-zē-on) This is a chronic inflammation of an oil gland on the eyelid. The swelling is usually localized and relatively painless. In rare instances the swelling may press upon the cornea and cause a disturbance in vision. In such cases the chalazion may be removed surgically.

**COLOR BLINDNESS** The inability to distinguish certain colors. This is most commonly an inherited characteristic in males. Total color blindness is very rare. Typically, color blind persons can distinguish many colors but confuse only certain ones.

**CONJUNCTIVA** (kon''-junk-tī'-vah) A mucous membrane that lines the inner portion of the eyelid and the anterior portion of the eyeball with the exception of the cornea. This membrane helps to keep the eyeball moist and to protect it.

**CONJUNCTIVITIS** (kon-junk''-tiv-ī'-tis) An irritation or inflammation of the conjunctiva. It is characterized by a watering of the eyes and excessive mucus secretion. This may be accompanied by a feeling of "something in the eye." Conjunctivitis can be caused by an allergy, infection, or trauma. Pink eye, a common conjunctivitis in children, is so named because of the red appearance of the conjunctiva.

**CONTACT LENSES** These are corrective lenses (usually a type of plastic) that fit directly over the front surface of the eyeball. The lenses may be hard (not flexible) or soft (flexible) and come in a variety of tints. Contact lenses are normally used to correct refractive errors, but may also be used to aid healing in some corneal diseases or injuries. Contact lenses do not actually "contact" the eye but float on a thin film of tears.

**CONVERGENCE** (kon-ver'-gense) A movement of both eyes toward the nose when looking from far to near. This movement is necessary in order to maintain single vision when looking at close objects.

**CORNEA** (kor'-nē-ah) The transparent front portion of the eye behind which can be seen the iris and pupil. The cornea supplies the majority of the focusing power of the eye. (See diagram of the eye.)



**CROSSED EYES** The situation in which one or both of the eyes point towards the nose. Crossed eyes in children may be caused by an excessive amount of hyperopia (far sightedness). Treatment may be through the use of lenses, visual training, surgery, or a combination of these.

**CYCLOPLEGIC** (sī'-klō-plē'-jik) A class of drugs used to inhibit the process of accommodation and, to dilate the pupil. These drugs are sometimes used during an eye examination to aid in determining the refractive state of the eye.

**DIABETES** (dī-ah-bē'-tēz) A disease characterized by the inability of the body to metabolize sugars (carbohydrates). This condition may affect a person's vision and can cause serious damage to the retina.

**DILATION OF PUPIL** A process whereby the pupil of the eye enlarges. This occurs when a person goes into a dark room or outside at night. (See mydriasis.)

**DIPLOPIA** (di-plō'-pē-ah) Double vision. A single object seen as two.

**EDEMA** (e-dē'-mah) Swelling caused by an excessive amount of fluid in tissue. Ocular edema is often caused by trauma to the eye. Edema of the retina can occur in certain diseases such as high blood pressure or diabetes. Edema may also cause clouding of the cornea, which normally is transparent.

**EMMETROPIA** (em''-ē-trō'-pē-ah) A condition where light rays from a distant object come to a perfect focus on the retina with no accommodative effort. A person who is neither nearsighted or farsighted is said to be emmetropic.

**EYE MUSCLES** The six tiny muscles that are attached to the eyeball which control the movements of the eye. These muscles rotate the eye and move it vertically and horizontally.

**EXOPHTHALMOS** (eks''-of-thal'-mos) A protrusion of the eyeball. This is most often congenital or due to a thyroid gland dysfunction.

**FARSIGHTED** (See hyperopia.)

**FOCUS** The process of adjusting the lens inside of the eye to make vision clearest. The main focusing elements of the eye are the cornea, crystalline lens, and the fluids surrounding them.

**FOVEA** (fōv'-ē-ah) A small region on the retina which represents the area of maximum visual acuity. (See diagram of the eye.)

**FUNDUS** (fun'-dus) The inside portion of the eye that the doctor observes when checking the internal health of the eye.

**GLAUCOMA** (glaw-kō'-mah) The condition in which there is an increase in the intraocular pressure of the eye to a point that causes progressive harm to vision. It can cause partial or complete blindness if not detected and controlled.

**HALOS** (hā'-lōz) These are fog-like rings or haze observed when looking at bright objects. They can be an indication of pathology but may also be due to other conditions such as dirty or poorly fitting contact lenses.

**HORDEOLUM** (hor''-dē-ō'-lum) An infection of an oil or sweat gland of the eyelid. This may occur on the inner or outer portion of the lid. An internal hordeolum is much more painful than one located on the outer portion. Hot compresses and antibiotics may be used in the treatment of both types of hordeola.

**HYPEROPIA** (hī''-per-ō'-pē-ah) Also called farsightedness. A visual condition in which a person sees objects that are far away more clearly than near objects. Farsighted persons often must strain their eyes to obtain clear vision while reading or for other close viewing. If the amount of farsightedness is great enough, a person cannot see well in the distance either.

**HYPERTENSION** (hī''-per-ten'-shun) This condition is commonly called high blood pressure. It is a disease which causes increased risk of stroke, kidney damage, and heart damage if untreated. Hypertension may be detected during a visual examination because blood vessels may be viewed directly on the fundus of the eye.

**I.O.P. (Intraocular Pressure)** The amount of pressure the fluids within the eye exert on the structures of the eyeball. The fluids are produced and replaced at a constant rate. If the fluid production rate is faster than the removal rate, an increase in I.O.P. results (see glaucoma). The I.O.P. is measured with an instrument called a tonometer.

**IRIDECTOMY** (ear''-i-dek'-tō-mē) Any surgical cut of the iris. This is most commonly done just before removal of the lens in cataract surgery.

**IRIS** (ī'-ris) The colored part of the eye. The iris, a delicate layer of tissue, is pigmented and contains muscles to control the size of the pupil. (See diagram of the eye.)

**IRITIS** (ī-rī''-tis) An infection and/or inflammation of the iris. It is often painful and causes the eye to appear pink or red. Professional care should be sought for treatment of the infection.

**KERATITIS** (kare''-ah-tī'-tis) An infection and/or inflammation of the cornea which can be painful and usually causes a red eye. Keratitis usually is accompanied by a reduction in visual acuity.

**KERATOCONUS** (kare''-ah-tō-kō'-nus) An abnormal thinning of the central cornea whereby the cornea becomes distorted into a conical shape. This condition is often hereditary and usually results in poor vision in the affected eye. The therapeutic use of contact lenses is often used to control keratoconus.

**LEGAL BLINDNESS** Legal blindness definitions vary from state to state. A person need not be totally blind to be considered legally blind. Most legally blind individuals still have some residual vision and many can actually distinguish large objects. A reduction in visual field (the total area a person can see when looking straight ahead) may also lead to the classification of legal blindness. In Oregon, best corrected visual acuity in the best eye of 20/200 or less or a reduction of visual field in the best eye to 20 degrees or less constitutes legal blindness.



**LENS** 1. Crystalline lens - This is an actual structure inside the eye which does much of the focusing so that one can see objects up close as well as those far away. As one gets older, the crystalline lens loses its ability to focus on objects which are close by (presbyopia). (See diagram of the eye.) An opacity of the crystalline lens is called a cataract.

2. Cylinder lens - A lens of this type is used if the human eye does not focus light into a sharp (point) image on the retina, but instead focuses it into a blurred streak. People with astigmatism need this type of lens.

3. Minus lens - A lens thicker at the edges than at the center. This type lens splits light farther apart rather than focusing it to a single point. Nearsighted (myopic) people need this type of lens.

4. Plus lens - A lens thicker in the center than at the edges. This lens focuses light to a single point. Farsighted (hyperopic) people need this type of lens.

**LIGHT SENSITIVITY** (see photophobia)

**LOW VISION** A severe reduction in vision that may be caused by cataracts, high astigmatism, retinal degenerations, or an inability to keep fixation on an object. Special lenses, telescopes, microscopes, magnifying glasses, and other aids may be used to maximize a low vision patient's usable sight.

**MACULA** (mak'-ū-lah) A small area of the retina which is responsible for seeing fine detail and distinguishing colors. In the center of the macula is the fovea which is the most sensitive part of the entire retina. (See diagram of the eye.)

**MACULAR DEGENERATION** (mak'-ū-lar) There are several types of macular degeneration; however, all result in a decrease in the ability to see small detail. Vision may decrease until only large objects can be recognized. The most common type, senile macular degeneration, is caused by a decreased blood supply to the retina.

**MICROSCOPE** An optical device used to magnify the image of a small object in order to make it more easily seen.

**MIOSIS** (mī-ō'-sis) The process whereby the pupil of the eye becomes smaller by contraction of certain muscles in the iris. This normally happens in bright light. Drugs called "miotics" will also cause the pupil to become smaller. These drugs are sometimes used following eye surgery and for control of various diseases.

**MIOTIC DRUG** (mī-ah'-tik) A drug which causes the pupil of the eye to become smaller. It has the opposite effect of a mydriatic drug.

**MYASTHENIA GRAVIS** (mī'-as-thē'-nē-ah gra'-vis) A disorder of neural transmission in skeletal muscles. The chief signs are weakness and excessive fatigability of the muscles. Early ocular symptoms include ptosis and double vision. These symptoms are usually more severe late in the day and improve with rest.

**MYDRIASIS** (mī-drī'-ah-sis) The process whereby the pupil of the eye becomes larger by relaxing some of the muscles in the iris. This process normally occurs when one enters a darkened environment. Doctors may dilate the pupil by using a class of drugs known as mydriatics to obtain a better view of the internal eye structures.

**MYOPIA** (mī-ō'-pē-ah) A visual condition in which a person can see better at near than at a distance (near-sightedness). A myopic person seldom complains of difficulty reading, but does complain of decreased acuity when driving or looking at a distance. In myopia, light rays from a distant object come to a focus before they reach the retina and therefore form blurred images on the retina. Myopes may improve their distance acuity to a certain degree by squinting. Treatment of myopia includes concave (minus) spectacle lenses or contact lenses.

**NEARSIGHTEDNESS** (see myopia)

**NIGHT BLINDNESS** A term used to describe an abnormal decrease in vision when in the dark or in dim illumination. A person with night blindness may not be able to safely drive a car at night.

**NYSTAGMUS** (nī-stag'-mus) An uncontrollable rapid back-and-forth movement of the eyeball. This can be side-to-side, up-and-down, or a combination of the two. Physiological nystagmus is a normal oscillation of the eye which cannot be detected without special equipment.

**OPACITY** (ō-pass'-i-tē) A change in the normally transparent material inside of the eye which does not allow the normal passage of light and thus decreased the ability to see. Opacities can occur in the cornea, crystalline lens, or vitreous. When an opacity is located within the crystalline lens, the condition is called a cataract.

**OPHTHALMOLOGIST** (of''-thal-mol'-ō-jist) A medical doctor specializing in eye surgery and the treatment of eye diseases requiring the use of drugs.

**OPHTHALMOSCOPY** (op-thal-mos'-kō-pē) The examination of the structures and general state of health inside the eye - especially of the retina. The instrument used for this purpose is called an ophthalmoscope.

**OPTIC DISK** The area at the back of the eye where the nerve fibers exit from the eyeball to begin the optic nerve. The nerve fibers directly on the optic disc are insensitive to light and produce a small area called the blind spot where no vision takes place. (See diagram of the eye.)

**OPTIC NERVE** The major nerve between the eye and the brain. It carries all of the visual information into the brain and some information from the brain back to the eye. (See diagram of the eye.)

**OPTICIAN** (op-tish'-an) There are two types of opticians: (1) a person trained in cutting, edging, and finishing the spectacle lenses and the fitting of them into frames is called a bench optician. (2) a person trained in measuring the patient's face for the prescription and adjusting of the spectacle frames to the patient's face is a dispensing optician.

**OPTOMETRIST** (op-tom'-e-trist) A person trained to evaluate, treat or correct visual problems through the use of spectacle lenses, contact lenses, low vision aids, and visual training.

**ORTHOKERATOLOGY** (or''-thō-kare-ah-tol'-ō-je) A treatment used by vision care practitioners typically to decrease the amount of myopia (nearsightedness) with the use of specially fitted contact lenses which reshape the patient's cornea.

**OVERWEAR SYNDROME** This results from wearing contact lenses longer than the eye can readily withstand during any period of time. The results are painful eyes, redness, tearing, sensitivity to light, and reduced ability to see clearly. Immediate professional care and treatment should be sought.

**PAPILLEDEMA** (pap''-il-e-dē'-mah) A swelling of the optic disc usually associated with increased pressure of the fluid surrounding the brain, or a blockage of the central vein of the retina. A person is usually unaware of papilledema until it has progressed considerably, but it can be detected during a visual examination.

**PHORIA** (for'-ē-ah) The natural resting position of the eyes. The eyes go to this position when they are not viewing the same object together. Exophoria describes a tendency of the eyes to turn outward and esophoria describes a tendency of the eyes to turn inward.

**PHOROPTER** (for-op'-ter) One of the instruments the eye care practitioner uses for testing vision. It has many lenses and is used for several different tests. A major use of the phoropter is to determine a patient's refractive status.

**PHOTOSENSITIVE LENSES** Spectacle lenses which change shades with different intensities of light. They turn darker outside in sunlight and lighten indoors.

**PINGUECULA** (ping-qwek'-ū-lah) A small yellowish elevation usually found on the eyes on the nasal side. These are due to a degeneration of the conjunctiva and are common with advancing age. They rarely require treatment.

**PINK EYE** (see conjunctivitis)

**PLASTIC LENSES** These lenses offer both advantages and disadvantages to patients wearing spectacles. Advantages include considerably reduced weight and reduced tendency to shatter. Disadvantages of plastic lenses are that they scratch more easily than glass and are more prone to warpage.

**POLARIZING LENSES** These are lenses, often used in sunglasses, which are especially effective in reducing glare from reflected light.

**PRESBYOPIA** (prez''-bē-ō'-pē-ah) A weakening of the ability to accommodate. The presbyopic person may complain of headaches, visual fatigue, or that their "arms are too short" when they are trying to read. This loss of accommodation usually begins around 40-45 years of age. Spectacles in the form of reading glasses or bifocals are usually prescribed.

**PRISM** A special form of lens which causes light to be shifted in one particular direction. They are used in testing the eyes during an examination. Prisms are sometimes necessary in spectacles to obtain comfortable vision or to eliminate diplopia (double vision).

**PTERYGIUM** (ter-rij'-ē-um) The growth of a fold of conjunctiva onto the cornea. It resembles a pinguicula and frequently is preceded by one. Repeated irritation of the conjunctiva and the cornea by ultraviolet light, dust, or wind may cause this condition; thus people working outdoors are most commonly affected. Treatment is by surgical removal of the tissue.

**PTOSIS** (tō'-sis) A drooping of the upper eyelid. It may be present at birth (congenital) or acquired later in life. Congenital ptosis is usually bilateral and may be due to failure of the eyelid muscles to develop completely. In unilateral cases, an intracranial lesion or birth injury could be involved. Acquired ptosis can result from injury to certain facial nerves or from diseases such as myasthenia gravis.

**PUPIL** The round black circle seen in the center of the eye. The pupil is actually a hole in the iris which controls how much light enters the eye. The pupil is normally larger in dim light and smaller in bright light.

**REFRACTION** (rē-frak'-shun) Refers to the part of a visual examination concerned with determining the lenses which will allow maximum clarity of vision and maximum comfort for the patient.

**REFRACTIVE ERROR** The amount of nearsightedness, farsightedness, or astigmatism an individual has.

**RETINA** (ret'-i-nah) The thin, delicate, innermost layer of the eye. It contains cells (photoreceptors) that respond to light and send visual information to the brain. The vision specialist examines the color, blood vessels, and any pathology present in the retina by using the ophthalmoscope. (See diagram of the eye.)

**RETINOSCOPY** (ret'-nos'-kō-pē) A procedure in which refractive error and accommodation are evaluated by observing reflections from the patient's retina. Such a procedure requires no verbal response from the patient. The instrument used is called a retinoscope.

**SAFETY LENSES** Spectacle lenses that are manufactured for greater impact resistance. These lenses are usually thicker than average spectacle lenses and are inserted into sturdy plastic frames. Safety lenses are required for certain occupations. These lenses are not shatterproof, but only impact resistant. A chip or crack in the lens reduces this resistance and the lens should be replaced.

**SCOTOMA** (skō-tō'-mah) A blind or partially blind area in a person's field of view. Scotomas may be of pathological or psychological origin. The location of scotomas are plotted with visual field testing instruments.

**SLIT LAMP** Another name for a biomicroscope. It derives its name from the narrow slit of light that it produces. It is used to examine the structures of a patient's eye under various degrees of magnification.



**SNELLEN CHART** Lines of letters of graduated size used to test a patient's visual acuity. The letters get smaller as one progresses down the chart. The visual acuity can then be expressed as a fraction indicating the size of the smallest letters discriminated.

**SPECTACLE BLUR** A blurring of vision which may occur immediately after contact lenses are removed and spectacles are put on. Spectacle blur is usually of short duration and is more pronounced with hard contact lens wear than with soft contact lenses.

**SPOTS BEFORE THE EYES** Another name for "floaters". These are often experienced by older persons or by people with myopia. The floaters probably are clumps of protein floating in the vitreous. A person may be bothered by these spots when looking at a bright sky or a light background. They appear to move or float and cannot be focused upon or seen clearly. Floaters are usually not harmful but a constantly viewed floater, the sudden onset of floaters, or a perception of a shower of floaters or sparks should be reported to the doctor.

**STRABISMUS** (strah-biz'-mus) A condition in which the eyes fail to point or look in the same direction simultaneously. One eye may turn in towards the nose (esotropia) or out away from the nose (exotropia). Often the deviating eye is suppressed or not used. Strabismus may be treated with lenses, prisms, visual training, or surgery.

**STYE** An infected oil gland in the eyelid which resembles a pimple and is often painful (see hordeolum).

**SUBCONJUNCTIVAL HEMORRHAGE** Bleeding beneath the conjunctiva. This bleeding may occur spontaneously or be associated with sneezing, coughing, or lifting a heavy object. Subconjunctival hemorrhages are usually not painful and often disappear with no treatment.

**SUPPRESSION** (sah-presh'-un) A process whereby the information received by one of the eyes is not perceived by the individual. It is as if the suppressing eye is "turned off" by the brain. Visual training is often used to eliminate suppression.

**TEARS** Fluid produced by glands of the eye which keeps the outside of the eye moist and provides nutrition to the cornea. The tears also contain an enzyme (lysozyme) which aids in the prevention of bacterial growth on the eye.

**TELESCOPE** An optical device used to magnify the image of distant objects. Telescopes for astronomical use are usually one foot or greater in length while telescopes used by people with low vision are usually one or two inches long and can be fitted into spectacle frames.

**TONOMETRY** (tō-nom'-e-trē) A procedure used to check the pressure within the eyeball. This is an important test to determine the presence of glaucoma (see I.O.P.). The instrument used is called a tonometer.

**TRIFOCAL** (tri'-fō-kal) Spectacles in which there are three distinct sections of the lens. One section is for distant viewing, one section for intermediate viewing (2-6 ft.), and one section for near viewing.

**TROPIA** (trōp'-ē-ah) A condition in which both eyes do not point in the same direction at the same time. When a person is looking straight ahead, the tropia is classified by the direction that the deviated eye points. If the deviated eye points outward it is called exotropia; inwards, esotropia; upwards, hypertropia; and downwards, hypotropia. (See strabismus.)

**UVEITIS** (ū''-vā-ī'-tus) An inflammation of certain internal structures of the eye. The structures affected may include the iris, ciliary body, or choroid. (See diagram of the eye.)

**VER** (Visually Evoked Response) A procedure used to evaluate the visual system by measuring electrical signals from the portion of the brain associated with vision (visual cortex). VER examinations are of value in testing severely handicapped individuals or individuals where normal procedures are impossible or verbal communication is severely limited.

**VISUAL ACUITY** (a-kū'-i-tē) A measure of the ability to distinguish object detail. This is usually tested at distance and at near. Visual acuity is often expressed in fraction form such as 20/20, 20/60, 20/100. 20/20 is better than 20/60 and 20/60 is better than 20/100, etc.

**VISUAL TRAINING** Eye exercises which are used for a wide range of patients. Visual training may be used to improve poor eye movements, to eliminate suppression, or to increase eye-to-hand coordination. Visual training is also used for developing normal vision in infants and for creating superior visual skills in persons who have special visual needs.

**VITREOUS HUMOR** (vit'-rē-us) A gel-like substance in the posterior part of the eye which gives shape to the eye. The vitreous, unlike the aqueous humor, is not constantly being absorbed and replaced. (See diagram of the eye.)

## CROSS INDEX

Accommodation: see focus

"Arms too short": see presbyopia

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Cataract surgery: see aphakia

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Drooping eyelid: see myasthenia gravis, ptosis

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Eye doctor: see Optometrist, Ophthalmologist

Eye drops: see cycloplegic

Eye exercises: see visual training

Farsightedness: see hyperopia

Flakes on eyelashes: see blepharitis

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Lazy eye: see amblyopia

Light sensitivity: see photophobia

Light sparks & flashes: see spots before eyes

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Pimple on eyelid: see hordeolum, chalazion, sty

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Rainbows around lights: see halos

Red eye: see conjunctivitis

Small pupil: see miosis

Stye: see hordeolum

Tropia: see strabismus

Wall eyed: see tropia

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